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AMERICAN DYESTUFF REPORTER

A Weekly Publication Devoted To

DYESTUFFS, COLORS and ALLIED CHEMICALS

Circulating Wherever Dyestuffs Are Used

Vol. I | New York, October 15, 1917 | No. 2

THE AMERICAN DYE INDUSTRY

Its Establishment and Protection

So much has been written during the past two years on the dye situation, its influence on various industries more or less dependent upon a regular and reliable supply of suitable dyes and artificial coloring matters, and the desirability of establishing the manufacture of at least the more important and more largely used of these very necessary commodities in this country, that, in undertaking to contribute more, one feels some hesitancy, as such notes must contain more or less repetition of what has been previously brought before the notice of interested parties. However, the subject is one of such great importance to the national welfare that the writer ventures to essay a few comments which may, he trusts, be of some slight interest.

The subject may, for convenience of handling, be considered from the points of view of the various factors bearing upon the successful establishment and conduct of the industry, and the many benefits directly and indirectly accruing to a nation possessing such businesses in a flourishing condition. We will therefore attempt an analysis under headings as follows:

The supply of necessary raw materials.

Machinery and plant.

The scientific and technical talent available for efficient and practical direction of the manufacturing processes and for research and investigation.

The difficulties inherent to the business as compared with foreign establishments.

Raw Materials Plentiful

Of the first it has been stated again and again that this country is producing quantities of the necessary raw materials many times greater than is required to fully supply all demands in normal times. This is true of some of the principal raw materials such as benzol, toluol, kylol and naphthaline. Others, such as anthracene, are not at present produced in large quantities as there is little or no demand for them. But that is only a question of demand, and the domestic tar distillers can no doubt meet conditions as they arise. Hence the question of the supply of raw materials may be dismissed—it will never stand in the way of success.

Machinery and plant, the next items to be considered, are more or less in the same category as raw materials. There is much apparatus necessary for the conduct of certain chemical operations of a special nature which have never been manufactured in this country. It is true that the large engineering and foundry companies have much to develop before they are able to produce entirely satisfactory products of this nature, but already they have shown a most commendable readiness to co-operate with users of such apparatus, and the final solution of these problems may safely be left in their hands.

With regard to the supply of technical and scientific men, who have had experience in this line of endeavor, the country is not as well supplied as it is with raw materials and plants. Of the very many extremely able, highly trained students and specialists, few have had experience in this particular branch of sci-

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WE are headquarters for Chemicals, Colors, Dyestuffs, Glycerines, Gums, Oils, Tanning Materials, Intermediates, and other products used in the various industries, and solicit your inquiries for prices when ever you are in the market, either for prompt delivery or future shipment.

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ence, which, as is well known, has been for many years almost entirely in the hands of German manufacturers. Moreover, very little literature of exact nature has ever been published on this subject and, as there is probably no manufacturing process more dependent upon minor details than the one under consideration, it stands to reason that an enormous amount of preliminary research work must be done before even the most ordinary of the various dyes can be made of a quality and at a price to compare favorably with those made by the foreign manufacturers, with their years of experience and specialization in this line.

The writer has every confidence in the ability of Americans to solve this problem, but it will readily be seen that to do so will involve considerable time and large monetary outlay, for success in a project of this kind is obtained only by experience, the gaining of which is often very costly. As one manufacturer puts it, there are many "tricks of the trade" to be learned and nothing but time and patience will teach them. This is one of the reasons why it is necessary to guard the manufacturer who is struggling to overcome these initial difficulties against ruthless competition such as he is likely to meet in the future.

The difficulties inherent in the dye business are partially covered in the foregoing remarks, but aside from them there are many common to other industries as well, such as higher cost of labor, rent, plant and supplies. Above all, is the fact that the cost of the majority, if not all, of the large foreign plants has already been "charged off" out of profits of the past, while an American manufacturer now entering the field has the burden of his invested capital to bear, making his problem a still harder one to solve.

Attention has often been directed by other writers to the direct bearing of this subject on the question of national defense. In view of this it is only necessary to draw attention to the fact that every complete "intermediate" factory is potentially a factory suited at short notice to produce in large quantities the powerful explosives which the present war has shown to be absolutely essential not only to offensive but also to defensive operations. The preponderance in this line which Germany had at the commencement of war gave her a tremendous advantage which it has cost her enemies untold losses in men and money to withstand until they were able to create similar factories for their own use.

Dye Industry a National Necessity

THE foregoing outline is surely sufficient to indicate the importance of the subject to the country at large. It is no exaggeration to say that the industry is so important that a country not possessing a well developed and efficient share of it is *not independent*. It has been contended that to provide protection sufficient to enable the domestic manufacturers to compete with the foreign factories would enable them to keep up the selling prices at exorbitant figures, but that is not a reasonable assumption. Domestic competition is keen and will become keener as the supply becomes equal to the demand, the consumer will get his dyes at the lowest figure compatible with the cost of American manufacture. Are not other businesses a proof of this? Where, for instance, can a better or cheaper automobile be bought, even in normal times, than in this country, and yet, as everybody knows, the proportion of imported automobiles in this country is, and has been, negligible.

It has been proposed, in lieu of further protection, to enact into law an "anti-dumping" measure to prevent foreign manufacturers from selling their products, especially their surplus products, in this market at too low a figure. It is extremely doubtful if such a course would be successful. In the first place, this country is not altogether innocent of such practice, and the passage, or at least the attempted enforcement of any such law against a foreign nation, would be sure to give rise to diplomatic controversy without end. Then again, it has not been a wholesale "dumping" or price-cutting campaign that American manufacturers have had to complain of, but rather a systematic underselling of those products in which they were particularly interested to their own particular customers. The profits so sacrificed

(*Continued on page* 13)

INQUIRY DEPARTMENT

In the establishment of this department it is our desire to help the consumer in buying his products direct from the manufacturer or reliable dealer. Accordingly all questions relative to source of supply will be answered to the best of our ability in an impartial way.

Furthermore we propose to help in any difficulties that consumers may be having with dyes and chemical products providing that questions do not involve simply tests, which can be readily obtained from those who specialize in such work.

We hope that the consumer will not hesitate in making use of the department for all questions relative to processes, etc., will receive the personal attention of a chemist who is fully qualified to handle the subject.

In our first issue we mentioned our intention of establishing this department and our offer has already brought two inquiries which seem to be of sufficient interest to all of our readers to warrant publication. For economy of space we will omit the customary practice of printing the irrelevant parts of the letter.

Question—Can you inform me how I can obtain a red stain soluble in alcohol which will be impervious to water. I wish to use it in refinishing leather goods and will use a small amount of shellac in the liquid?

Answer—There are a few oil soluble reds of American manufacture on the market and these are generally soluble in alcohol but in case you cannot obtain just what you want you can take a strong solution of Fast Red A in water and add just enough of a basic red like Fuchsine or Safranine to exactly precipitate the acid color. The end point may be determined by dropping a drop of the liquid on filter paper, at the beginning the Fast Red will form a ring outside the sediment or precipitate and if too much basic color is present it will form the ring but when the precipitation is sharp the precipitate will have only clear water surrounding it. The precipitate is collected and when drained free of water will dissolve in alcohol and not be soluble in water. Blue shades can be made by using Methyl Violet with the basic red and yellower shades by using Chrysoidine. This method was used successfully five years ago and can easily be repeated with the dyes now available.

Question—How is Nigrosine tested by dyeing on wool? The best results we have been able to obtain are all thin greys and blues which wash out and rub.

Answer—A wool dyeing is worthless as a test for the strength of Nigrosine because the dye has little affinity for the fibre while any acid dyes added for shading purposes have their full affinity. Tests may be made by colorimetric methods or a small batch of paper pulp colored and fixed with alum and made into a sheet will give a comparison. Chrome tanned leather may also be dyed but unless the samples are finished under identical conditions the results will be misleading.

THE INDUSTRY AS THE CONSUMER SEES IT

We believe that America is able to make successfully anything that can be made abroad. Also, therefore, that our facilities are as good as any government on earth.

We want America to develop all branches of industry to compare favorably, and if possible to discount her foreign neighbors. Then in case of war or other disasters, such as we have been obliged to go through or may be in future, we will be *"prepared."*

No one can forsee what might happen in future years, therefore we should be awake and watchful in every possible latitude, so as not to be taken unawares and suffer thereby.

Present tariff rate is fair, but should include all dyestuffs, and all other coal tar products. Foreigners procuring patents in United States America should be compelled to manufacture products in this country.

In England it has always been considered proper for dyers and finishers to get gifts from the different dye and drug manufacturers. In America, all concerns who employ a chemist are free from this sort of thing. I do not believe that any of the *reputable* dye houses would countenance any crooked work.

Go gunning for prohibitive embargo until such time as American industry is on its feet. Also a working clause in our patent laws that will insure all steps of manufacture being conducted on American soil.

I think the bogie of the mystery of dyestuffs should be dispelled. The majority of manufacturers are afraid to go after the graft proposition because the technical features that infest the whole field of dyestuffs make them feel in the dark.

We believe the articles should be written in simple English, as they will then be understood by the technical man and the layman.

With reference to protective tariff we should have the tariff high enough to protect our industries and what it should be, should be ascertained carefully, and the tariff fixed on this basis so that after the end of the war our Americna factories will be able to compete with foreign producers.

We have not bought any color through brokers.

We believe in dealing direct with the manufacturer when the quantities are large enough to warrant the business being a direct manufacturer's business. We have no reason to believe that there is any graft in the handling of dyes between the actual manufacturers and the ultimate consumer, although there has been in the past few years a large amount of speculation, but to our knowledge the legitimate manufacturers have not insisted on any of their products being bought at fabulous prices through any broker or dealer.

Get all the articles on American dyes that you can and boost home industries, and this one in particular, it is a new industry, and the experience of the last two years has taught us a lesson in regard to dyestuffs that we shall be a long time in forgetting.

It will take a long time to perfect the so-called German dyes in the United States, and we shall have to be patient and for a time we may have to put up with the dyes as they are, but I am informed that the new companies who are manufacturing dyes are adding new dyes almost every month to the list they have already made.

The idea seems to prevail (and newspaper publications have repeatedly circulated it) that large quantities of dyes are being made in this country and that we are *now* practically independent of Germany.

Our information is that only a few of the high class colors are to be had, and these at very high prices. Sulphur black is, of course, plentiful, though still very high priced. There is need of good shades of sulphur blues, red, yellow, heliotrope, green, and many other colors. To inform the trade accurately as to what has been or is being done and by whom, so that actual supplies can be had, will render an important and acceptable service.

Also every effort should be made to induce the American manufacturer of colors to make their prices reasonable and be content with a fair margin of profit, instead of "hogging it" as many of them have been doing.

DICKS, DAVID CO.

Manufacturers and Sales Agents

Dyestuffs and Chemicals

302 Broadway, New York

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IN BEHALF OF OUR INFANT INDUSTRY

IT is unfortunate that the ultimate consumer cannot be shown the true state of the American Aniline Color industry for we then would be spared the humiliation of hearing the over-zealous but misinformed salesperson telling the prospective customer why the store cannot guarantee the colors. We realize that no American manufacturers have yet produced Vat colors and we also know as a fact that their use before the war was confined to a rather restricted class of goods, but why the lack of these colors should be taken as an excuse for an apology for the really excellent dyes that are being made in this country from domestic materials no one but the salesperson and his employer can understand.

The fact cannot be too emphatically impressed upon the public that when a domestic firm produces a dye of a definite variety it has identically the properties of that dye wherever it may have been produced before. Even if the purity of the color is below par on account of hasty preparation and meager equipment it is the shade that suffers rather than the fastness. The products of the responsible firms that are now manufacturing colors are generally above criticism. We have seen Victoria Blue, Nigrosine, Sulphur Black, Induline, Methylene Blue and many other colors that surpass in many ways anything that ever came from either Germany or Switzerland.

Just as in mechanics or any other constructive art time alone can give the skill and finesse that is not to be had in any other way, so we may justly expect that the next few years will bring us to a height of attainment of which we may well be proud—providing The Ways and Means Committee of Congress does not allow the Pro-German element, that has exerted so much influence in the past, to balk all efforts to give the industry adequate protection.

Shall we answer the question "Why are the new American dyes not fast?" Generally, because the right dyes are not being used for the right purposes. The Khaki of our troops used to be dyed with either Sulphur colors or the combination of metaillic oxides still used for tents and awnings. Some contractors thinking only of their own profits used combination of Chrysamine, Direct Brown and Direct Black and the appearance after a little wear has caused much adverse comment as to American dyes in general. Sulphur Black on cotton hosiery cannot be surpassed for fastness and has never been a scarcity except through holding and speculation on the part of consumers, yet many used a Direct Black without after-treatment in thin slaty shades. Before the war the same Direct Black was used on half-silk hose with a Formaldehyde after-treatment and held its own beside Developed Blacks. Artificial silk hosiery and sweaters are to be seen in brilliant shades made with the whole gaudy range of basic dyes; they are unsatisfactory in fastness—will someone tell us how German dyes would have been better?

During the coming week a dealer has promised the writer to produce the first lot of domestic Patent Blue, which will mark a notable point in our progress. Up to this time while the simpler dyes were being perfected we were always reminded by our critics that Patent Blue and Rhodamine must be looked on as unattainable for American factories. Now, let some one hurry with the Rhodamine and put the Rhodamine tinted Dextrine where it belongs.

We almost omitted saying that a domestic Primuline has been produced by several makers, one sample at least being the equal of the old Badische type Primuline A Conc. That opens another discussion-types, shall we refer to our products as being "as good as the German so and so" or shall we some day have American standards for our products?

There are to-day many dyes of a uniform quality which are often mentioned by competing firms for purposes of comparison, yet no organized effort has been made toward standardizing the output of the various factories. The time is past when any small factory can send the consumer what it pleases and feel that the need for the dye is so acute that the user will not dare to complain for fear he will not get any more. The large manufacturers have their own standards and aim to make deliveries in the closest possible accord with sample. If they fail

in this at all times the reason is generally that the output is taken up too rapidly to permit aggregating and averaging the batches, a very necessary condition for uniformity. Many of the smaller factories are forced to buy their materials in relatively small lots and cannot always get a steady supply from one source, in such cases unsuspected by-products may be present and alter the shade of the finished product and as none of the raw materials are strictly chemically pure they are neither in a position to purify them nor insist on the grade they should have. Time will adjust these inconveniences but if we have a definite standard for each color the goods may be sold so the consumer will at least know what he is using.

A Dyehouse Superintendent Gives a Suggestion on Dissolving Dyestuffs

In dissolving dyestuffs, two kinds of insolubility are encountered, the dye itself may be difficult to dissolve or else there is an insoluble residue that requires special treatment. When the dye itself gives trouble always stir it to a paste with water first, then add hot water and boil, if necessary. A residue may either be due to an impurity or else to Lime and Magnesia in the water. Basic dyes are imprived by adding Acetic Acid. Direct dyes are always benefitted by Phosphate of Soda. Of the acid dyes the most troublesome are Fast Red and Azo Yellow. Plenty of boiling hot water is the best for them. When a basic dye has been reduced with salt or glauber salt trouble may always be expected.

SULPHUR KHAKI

For the past two months or so there has been an increased demand for sulphur khaki. The trouble in general with the dyestuff concerns who are contemplating the manufacture of this particular color is that there are so many different shades that to determine what color to offer is difficult. Sulphur khakis have run from a very yellowish-brown to a greenish-black.

Sulphur khakis are very complex mixtures which cause unevenness, streakiness and other objectionable properties. It has been found that several sulphur khakis were made from the base of sulphur brown which was nothing but fused sawdust and sodium sulphide combination.

Of late there have appeared on the market several sulphur khakis of true coal-tar base character which possess the same properties as the German sulphur colors which were obtainable previous to the war.

This new khaki has superceded the old mixtures which are now gradually being eliminated from the market. There is a brisk demand for these new khakis which have met with the Government's approval.

Sulphur khakis that have been aftertreated with ¼ per cent bluestone and ¼ per cent bichromate of soda and a slight addition of Acetic Acid have been found to stand the washing and soaping tests very satisfactorily. Also they are much faster to light.

The Gates Aniline and Chemical Company, of Cincinnati, Ohio, has increased its capital from $10,000 to $100,000.

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AMERICAN DYESTUFF REPORTER
Published weekly by
BLACK PUBLISHING CO.,
470 Fourth Ave., New York

DEXTER W. HEWITT, President
A. P. HOWES, Vice President
ELISHA HEWITT, Secretary and Treasurer

MYRON DREW REESER, Managing Editor

Domestic Subscription, $3 per year. Foreign, $4.
Advertising rates on request

A GET-TOGETHER MOVEMENT OF SMALL MANUFACTURERS

For the good of all concerned in the welfare of the industry there should exist a closer spirit of co-operation between the small manufacturers of dyestuffs and allied products.

The lack of get-together spirit is indeed lamentable and in many cases it is due to nothing more than jealousy.

The fear that one particular company might give out information which would benefit another has led to the consumer being kept in the dark regarding actual accomplishments.

Perhaps the small manufacturer was right in this when conditions warranted but now that the consumer is desirous of purchasing his colors direct and the small war-broker is being eliminated, the consumer should be told more about actual conditions.

There seems to be a willingness upon the part of the larger manufacturer to give this information, for they realize by experience that secretiveness does not breed a spirit of consumer good-will.

We all realize fully the difficulties in the way of a get-together movement and suggestions from all sources should prove of value to those manufacturers who really do want to see the industry established on a permanent basis.

A SUGGESTION

If instead of each small manufacturer sending out a number of inexperienced men who take up the valuable time of the consumer, they would pool their interests together and send out men who know the industry by experience, the consumer would be saved much annoyance.

If they would establish a sales organization on a mutual co-operative basis it would enable them to eliminate many difficulties. It would help in the discouragement of secretiveness and would result in the saving of valuable time of both manufacturer and consumer.

As its is now a representative of a small manufacturer with difficulty, gains admission into the presence of the man who actually does the purchasing and then has only three or four colors to offer him.

The chances are that the consumer does not happen to be interested in his particular colors and the interview simply means the loss of valuable time to a particularly busy man.

The discouraging part is that this happens many times in the day, and to the consumer this must indeed be particularly trying. The usual result is that the representative is informed by the office that they are not interested at present.

Can one blame the consumer for wanting to deal with a well organized company with representatives who can offer a more complete line?

The success of the established manufacturers has been due to a sales force composed of capable men who make regular systematic calls and have something to sell when they do call.

The consumer will occasionally need information regarding processes adaptable to a particular color and the salesman should be able to talk intelligently.

SYSTEM

We cannot sell dyestuffs to-day by averaging so and so many calls each week.

We cannot build up a permanent business unless we realize that the time of the consumer is valuable and that he will greatly appreciate a few moments in the day in which to attend to his particular duties.

One of the most important factors in the industry's success is system.

Systematic manufacture—systematic purchasing and systematic delivery will help, but success will not be attained until the ready co-operation of the consumer is gained.

The small manufacturers should change their methods as conditions have changed and when they do take up the time of a consumer have something to sell.

The only way this can be accomplished is the establishment of a sales organization as outlined, and this can and should be done. The consumer can be of much assistance in bringing about the acceptance of such a plan, and an appeal by them to the manufacturers will result in its accomplishment.

Co-operation for Competition

We are passing through a critical period and conditions in the industry will not improve when peace is declared. Competition is good for trade but unless there is a decided change in the attitude of the small manufacturer he will stand a mighty poor show.

Protective tariff is necessary and the country must see a movement on foot to permanently establish the industry, by manufacturer co-operation, before we can expect much in the way of protection. When each manufacturer is trying to undersell the other and in the mean time laying himself open to over-production. we cannot hope to compete with those other countries which are supported by a paternal government.

Let us then as representatives of the greatest government, stand together in commercial unity and in the building of the industry, work mainly for the industry's success and not individual gain.

By the permanent establishment of the industry success will be achieved by the individuals interested.

NOTES OF THE TRADE

It is reported that the Butterworth Judson Co., of Newark, is planning to erect a new one-story factory addition at a cost of about $32,000.

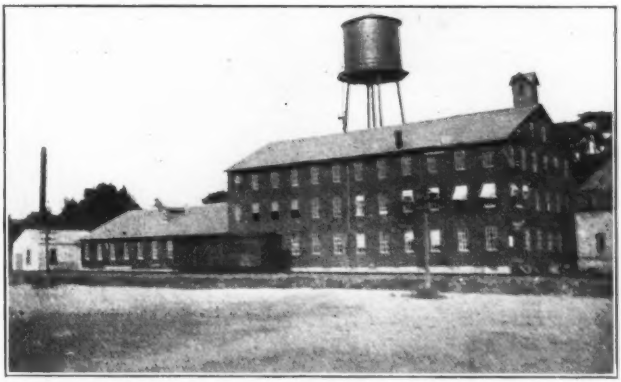
Lloyd Chemical Works, Inc., of Belleville, N. J., has been incorporated with $10,000 capital to manufacture dyes and chemicals.

With a few exceptions the market for coal-tar dyes and intermediates is notably firmer.

This perhaps is due partly to the extensive orders placed by the United States Government for upwards of 13,000,000 pounds of picric acid.

(*Continued on page* 14)

THE RECENTLY COMPLETED PLANT OF
THE METH-O-LENE CO. TATAMY, PENNA.



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EXPANSION OF DYESTUFF INDUSTRY IN THE UNITED STATES

IN reproducing the following article we digress somewhat from our original policy of publishing only news of the latest moment.

We were influenced in making an exception in this instance by the following letter:

Gentlemen:

I have read at length the first issue of your weekly publication, and it interested me quite a lot indeed.

You are perfectly right in asking the consumer for his opinion, as this is a point which is often overlooked.

I am enclosing a clipping which was handed to me through the office, and I think your readers will be interested in seeing it.

You have my letter of June 16, in which I answered your questions, so you know my views.

Very truly yours.

In response to inquiries for more complete information on the domestic industry than that given in the article on dyestuff production in the United States, which appeared in *Commerce Reports* for May 14, 1917, the Bureau of Foreign and Domestic Commerce on June 6 sent forms to all manufacturers of dyestuffs known to the Bureau, requesting their cooperation in securing more accurate returns. Practically the whole industry responded, the exceptions being a few minor firms and those just beginning operations and not in a position to calculate their probable output. Of 103 forms filled in and returned, all but three show in detail the capital invested and the variety, monthly production, and occasionally the quality of product manufactured by each firm, with frequent notations indicating the lines of experimental research now being conducted with a view to further development. On the remaining three forms reasons were given why only partial information was available.

Notices received during the year state that 12 firms have gone out of business or discontinued the manufacture of dyestuffs. Ten others have been eliminated by consolidations or absorbed by holding companies. An increasing tendency is shown in the industry to an amalgamation of interests among certain plants making crudes and intermediates with others producing finished dyestuffs, which will probably result in a more extended variety of colors at a decreasing cost of production. Several instances are noted where two or more allied corporations have apparently pooled their interests to facilitate the manufacture and marketing of their products, while one recent amalgamation includes some of the largest plants in the country.

Many of these great corporations have branches in various cities of the United States, and a few have established agencies in Latin-American capitals and in London, Paris and Shanghai.

The capital stock given on 90 forms aggregates $158,913,650. According to notices of very recent incorporations, 22 new enterprises have a total capital of $4,112,000, making the total investment in the industry $163,025,650, as far as actual figures are available. This amount does not include the capital invested in dyestuff production by 10 firms, some of which are just beginning operations, while others state that they are not incorporated and have no capital stock, but are amply financed, or are owned by a single individual. These plants will probably be in full operation by 1918 and add several million dollars capital to the dyestuff industry. Another difficulty encountered in computing the total capitalization is the fact that a number of firms which formerly manufactured only explosives or a general line of chemicals state that their dyestuffs are by-products of recent development and that it is impossible to draw a line of demarcation to determine just what portion of their capital is invested in color production. No effort has therefore been made to supply these missing figures. If full and accurate data were obtainable, it is believed that the recent estimate of $200,000,000 invested in the domestic dyestuff industry, published in one of the trade journals, would be too conservative.

Twenty-one of these corporations have invested from $1,000,000 to $21,000,000 each, and 10 others have a capital ranging from $100,000 to $800,000.

From figures submitted by manufac-

turers the following totals of monthly production for the current year have been compiled:

Firms making returns.	Products.	Pounds.
22	Crudes:	
	Benzol, toluol and some xylol and phenol..	*a* 1,240,350
	Benzol, toluol, natural and synthetic phenol, cresol, naphthalene, anthracene and some xylol, cumol and amylene..	6,181,600
40	Intermediates	10,420,600
46	Artificial colors	5,000,000
13	Vegetable dyestuffs and extracts (including some tanning extracts) not stated separately.	8,183,500

a Gallons.

The above returns were submitted voluntarily and are as nearly complete as can be obtained by correspondence. For general purposes, they are fairly representative of the industry as a whole, though faulty from a statistical standpoint since, as stated, no returns were received from several minor firms so recently established as to be unable or unwilling to go into details of product and output, but whose combined production for the remainder of the calendar year would constitute only a small percentage of the whole. In some instances the figures for benzol are in excess of the amount used in the production of synthetic phenol. In this connection, it may be interesting to compare the above with published estimates by a leading authority on the subject that out of an approximate benzol production for 1917 of 220,000,000 pounds only 37,000,000 pounds would be used for dyes; and a present indicated consumption of 12,000,000 pounds of naphthalene per annum in the manufacture of intermediates.

As stated by some of the larger firms, it is, of course, difficult if not impossible to give the exact amount of each article produced month by month, as the production varies according to the market. The demand for certain colors remains constant, while others are discontinued and the intermediates required in their manufacture are diverted to other purposes. The industry is still in the experimental stage, many products being manufactured on a semi-commercial scale, with processes not fully developed and qualities not yet standardized. In the case of the larger groups or amalgamations, the proper co-ordination of multiple phases of manufacture is being slowly perfected. The limited capital and productive capacity of newer plants frequently limit their operations to the filling of actual orders without any attempt to carry their products in stock.

In round numbers, the 40 estimates of the monthly output of manufacturers of intermediates range from 1,000 to 2,000,000 pounds each. The monthly production of three factories reaches seven figures, and that of 15 others is expressed in six figures. Some of the factories make only the intermediates required for their own consumption in producing finished colors, some manufacture in excess of their own needs, while the efforts of others are confined to a line of intermediates only. The major portion of the total output of intermediates is probably consumed in the dyestuff industry, although a large amount, especially trinitrotoluol, falls in the category of explosives. There is a constant increase in the variety of intermediates and chemicals produced in this country for making colors. Dyestuff manufacturers are now producing large quantities of toluidines, resorcin, xylidine dianisidine, naphthylamine, diphenylamine, tolidine, benzidine, benzaldehyde, benzylchloride, nitrobenzol, nitrotoluol, H-acid, phthalic, metanilic, sulfanilic and naphthionic acids, naphthosulfo acids, naphthylaminsulfo acids and amidonaphtholsulfo acids, Schaeffer's salt, paranitraniline, dimethylaniline and numerous others.

A glacial acetic acid plant of large capacity is expected to begin operation in September, and will be of the greatest assistance to the industry in general.

The current monthly production of 46 manufacturers of finished dyes is at the rate of 5,000,000 pounds, or 60,000,000 pounds annually, individual outputs ranging from 600 to over 2,000,000 pounds each. This does not include any estimate from one plant of the first magnitude whose entrance into the industry has just been announced to the trade, or a score of smaller projects organized but not yet

in full operation. The total shown includes only the figures given by the factories of actual production for the current calendar year and makes no allowance for many plants now in course of construction which will soon be producing colors on a commercial scale, nor for the output of many dyes still in the experimental stage. These facts leave no doubt that our present annual domestic output greatly exceeds in quantity the entire consumption of artificial colors in the United States during the year 1914, estimated at 60,000,000 pounds, and is probably equivalent to the current annual consumption, which is considerably in excess of that for 1914. The returns further show beyond all question that a vast amount of technical talent and native inventive genius are now being concentrated on experimental research to perfect processes of production, improve quality, and enlarge the variety of dyes so as to include not only the more complex known colors currently used in Europe but possible new ones.

Coal-tar dyes in a variety of colors suitable for leather, textiles, straw, paper, inks, stains, pigments, varnishes, waxes, feathers, furs and for many other purposes are now regularly obtainable from domestic sources. Several manufacturers carry full lines of direct, acid, basic, chrome, oil, and sulphur colors, while others confine their efforts to improving and extending their output of particular groups. Prominent among the colors produced are nigrosines, indulines, triphenylmethane dyes, safranines, eosines, chrysoidines, rhodamines, rosanilines, direct fast reds, browns and yellows for cotton, fast chrome colors for wool, Sudan colors, basic violets, synthetic indigo and indigotines, alkali blues for the silk and woolen industries and also for the lithographic trade, metanil yellow, methyl violet, methylene blue, benzopurpurine, benzo sky blue, primuline, naphthol green, rose bengale, gallocyanine, and special chrome and khaki colors.

Considerable attention is being given by about a dozen firms to developing as rapidly as the requisite intermediates are available the triphenyl-methane dyes, particularly fuchsine, methyl violet, methylene blue, magenta, and malachite green. Their output of many of these colors was not separately stated by some of the factories. The itemized figures given by only a few of the plants, however, show a monthly production of this series of colors amounting to 62,200 pounds. Of this quantity 18,200 pounds represent methyl violet and 13,450 pounds methylene blue. Two manufacturers specialize on the needed intermediates for these dyes.

There is a largely increased production and variety of reds, yellows, and scarlets, prominent among them being parareds for the printing trade, lithol red R, paramagenta, croceines, fast red Bordeaux for wool, acid reds and scarlets, wool scarlet, Biebrich scarlet, chrome yellow, metanil yellow, chrome orange, and brilliant orange. A wide range of fast reds, blues, greens, yellows, blacks, and grays for cotton is also available.

Colors now produced on a commercial scale that were not made in this country until recently are alizarin blues, browns, and yellows for calico printing, and for wool; paracolors for lakes or pigments, vat dyes (sometimes called indigoids) for cotton shirtings and ginghams, synthetic indigo, rhodamine, patent blue, and Biebrich scarlet.

Plants Can Increase Output as Demand Warrants

Present production and new developments contemplated include blacks and greens in natural colors for calico printers, a special logwood blue, special mordants for dyeing new shades in direct cotton colors, khaki dyes, cutch, archil, and logwood extracts, and cudbear powdered, orange, and lemon flavines, Osage orange in a variety of shades, American sumac extract, indigotin, and natural indigo shades. It is stated by several plants that their output depends on the domestic demand, ample facilities being available for a largely increased production at any time. Some operate at half capacity, while others are running twenty-four hours a day.

One firm is making sulphur brown (not a coal-tar product) on an extensive scale, while another company is producing mineral colors in standard shades for wool.

Soluble Prussian blue, Chinese blue, pigment brown, lakes in all the principal

colors, paratoners, dry colors, and dyes for lake makers are specialties handled by different manufacturers.

The urgent demand for photographic developers since the war began has greatly stimulated the production of hydroquinone, p-amidophenol, metol, amidol, and reducin. Single firms report monthly outputs of 1,000 to 15,000 pounds each of hydroquinone.

Manufacturers of coal-tar by-products are also marketing quantities of salicylic acid and its derivatives—particularly acetyl-salicylic acid (aspirin)—phenacetine, acetphenetidin, acetanilide, and other medicinals.

One maker of intermediates is producing the synthetic perfumes nerolin and bromelia. Another firm includes vanillin, used in flavoring extracts, in its list of products, and also saccharin.

The most striking feature brought out on the forms filled in by the dyestuff manufacturers is the marvelous growth of the industry and the plans in process of formation for its continued expansion in both domestic and foreign fields.

Announcement has been received of the entrance into the dyestuff industry of the leading company manufacturing explosives, fully equipped with a chemical and engineering staff, plants, and laboratory facilities, and an adequate commercial organization to meet the demand for colors on a vast scale. Other new plants in process of construction or to begin operations before 1918 are two for coal-tar crudes, one for anthracene, one for glacial acetic acid, four new buildings for aniline dyes, one for chrysoidine and methylene blue, one for nigrosine, induline and magenta, and one for nigrosine only. A producer of direct, acid, and chrome colors expects to double his present output of nearly half a million pounds annually inside of twelve months. One plant making methylene dyes is planning to double its capacity, two others making aniline colors will also double their capacity shortly, one manufacturer expected to have patent blue and fuchsine on the market after July, one of the larger corporations is now making auramine and lanafuchsine on a small scale and installing equipment for their increased output, and another contemplates the manufacture of primuline in considerable quantity. A producer of high-grade colors for silk is enlarging his factory and contemplates the early production of safranine and a suitable plant for the extensive manufacture of aniline dyes.

Notations on a very large proportion of the forms returned show that experimental research is in progress on a great variety of products that are now being manufactured on a semi-commercial scale with a view to increasing production as the processes are worked out in the different establishments.

Foreign trade opportunities published in *Commerce Reports* during the past few months from agencies in Norway, Spain, Brazil, Venezuela, and several from India, indicate foreign fields awaiting exploitation in this line, while recent sales of such products have been made in England.

Dyes and dyestuffs exported from the United States during the fiscal year ending June 30, 1917, were valued at $11,710,887 as compared with $5,102,002 for 1916. Beginning with July 1, 1917, the classification for monthly statements of exports will include under dyes and dyestuffs the subdivisions, aniline dyes, logwood extract, and all other shown separately.

THE AMERICAN DYE INDUSTRY

(*Continued from page* 3)

by the foreign makers in order to embarrass their American competitors have been made up many times over from the high prices exacted for those products over which they exercise complete control either by reason of existing patents, trade secrets or monopoly of manufacture.

There is only one procedure which will result in the business being built to a size compatible with the needs of the country and that is the fullest protection after careful consideration and investigation, not by *politicians*, but by a committee or commission composed of the business and scientific authorities in this branch of trade.

For the good of America, may this be consummated.

NOTES OF THE TRADE

(*Continued from page 9*)

The Walker Chemical Company has been incorporated in Dover, Delaware, with a capital of $10,000. It is the intention of the company to manufacture chemicals, a list of which will appear in the REPORTER as the products are perfected and placed upon the market.

The National Chemical Products Corporation has been formed to manufacture and sell dyestuffs, chemicals and allied products. It is reported that the capital is something in excess of $2,500,000.

The Impertecu Chemical Co., has been incorporated with $200,000 capital and will engage themselves in the manufacture of chemicals.

A company has been formed in Brooklyn, New York, with a capital of $10,000 to manufacture and sell chemicals and products closely allied to the industry.

Natural Products Refining Co., has been incorporated in Newark, New Jersey, with a capital of $200,000 with which they intend to manufacture chemicals and allied products.

The Barnes Cooper Chemical Works, at St. Louis, Mo., has been incorporated with a total capital stock fully paid in of $30,000 to manufacture chemicals, dyes and other allied products.

DYESTUFFS AND CHEMICALS THAT ARE ACTUALLY OBTAINABLE

We suggest to our readers that they carefully preserve these lists, as in their complete form they will give a full and complete record of the sources of supply of all dyestuffs and chemicals manufactured or handled by reputable American companies.

RALPH L. FULLER & CO., INC.

Sulphur Black
Sulphur Brown, Khaki (all shades)
Chrysoidine Y
Bismarck Brown Y.YY
Direct Brown R

NATIONAL ANILINE & CHEMICAL COMPANY, INC.
244 Madison Ave., New York

Aniline Colors

Direct colors: for cotton, union goods, etc.:

Erie Black Gxoo
Niagara Blue 2B
Niagara Dark Blue 3R
Niagara Blue DB
Ammaco Direct Blue 3B
Erie Brown C
Erie Brown GR
Direct Brown T
Erie Green WT
Ammaco Direct Green WB
Erie Green MT
Erie Orange 2R
Benzo Purpurine 4B W
Congo Red 4B
Niagara Garnet R
Ammaco Primuline WB
Niagara Violet BW
Niagara Fast Yellow F
Niagara Yellow KM
Ammaco Chloramine Yellow WB
Ammaco Delta Red 2B

Sulphur Colors

For cotton, fast to washing, crossdyeing, etc.:

Sulphur Black F Conc Paste
Sulphur Black Sap Powder
Sulphur Blue Paste
Sulphus Blue Sap
Sulphur Direct Navy Blue
Sulphur Brown 2G
Sulphur Brown Sap
Sulphur Brown WF
Sulphur Brown LY Conc
Sulphur Green Sap
Sulphur Yellow BW
Sulphur Khaki all Shades

Acid Colors

For wool, silk, leather, lake making, etc.:

Buffalo Black NBR
Buffalo Black 10B
Buffalo Black 8B
Buffalo Black 3G
Buffalo Black RB
Ammaco Acid Black TR
Buffalo Black AR
Acid Black 4A B
Buffalo Fast Blue R
Buffalo Cyanone 3R
Induline
Resorcine Brown
Fast Brown
Ammaco Acid Green L
Orange A Conc
Orange S Conc
Orange 2G Crystals
Brilliant Scarlet 3R
Xylidine Scarlet

Fast Red S Conc
Scarlet BR
Azo Rubine Extra
Buffalo Fast Crimson R
Azo Bordeaux

Buffalo Fast Fuchsine D
Buffalo Fast Fuchsine G
Buffalo Fast Fuchsine R
Buffalo Fast Fuchsine 6B
Wool Red 40F
Cloth Red G
Cloth Red R
Croceine Scarlet Moo
Lanacyl Violet M
Acid Violet
Buffalo Violet 4B
Buffalo Fast Violet B
Wool Yellow Ex Conc
Azo Yellow A 5W
Metanil Yellow 1955

A. K. KLIPSTEIN & CO.
644 Greenwich St., New York

Acid Dyes

Indigo Extract BF
(made from Synthetic Indigo)
Induline AK
Azo Rubine
Brilliant Scarlet
Croceine Scarlet
Amaranth
Acid Wool Orange Paste
Acid Wool Yellow Paste
Victoria Blue B
Wool Green S

Basic Dyes

New Fast Blue RS
Patent Phosphine GG
Methylene Blue O Concentrated
Methyl Violet KA
Auramine O
Rhodamine B Extra
Rhodamine 6G Extra
Malachite Green AK

Chrome Colors

Gallocyanine 20% Paste
Flag Blue
Chrome Fast Black PWRL Concentrated
Chrome Fast Yellow G
Chrome Fast Yellow O

Direct Colors

Chrysophenine

Sulphur Dyes

Alpha Black
Zeta Black
Sulphur Brown BF
Sulphur Cutch BF
Sulphur Khaki BFY
Sulphur Khaki BFB
Sulphur Green BF
Zeta Blue, Green Shade
Zeta Blue, Red Shade

Vegetable Dyes

Fustic Extract
Logwood Extract
Logwood Crystals
Hematine Crystals
Super Hematine
Sumac Extract
Colorless Sumac Extract
Quercitron Extract
Quadruple English Archil Extract

Fast Fat Dyes

These dyes are made expressly for us by the Society of Chemical Industry in Basle, Switzerland:

Ciba Synthetic Indigo 20% Paste
Ciba Blue 2B 51% Paste
Ciba Blue 2 BD 16% Paste
Ciba Violet B 10% Paste
Ciba Violet B 100% Powder
Ciba Blue Green Shade
Cibanon Olive B Paste

INTERMEDIATES

Nitro Toluol
Dinitro Toluol
Meta Toluylene Diamine
Diamine Developer C (Crystals)
Toluidine
Aniline Oil
Para Phenylene Diamine
Oxide of Iron

ATLAS COLOR WORKS, Inc.

Manufacturers of

Indigotine
Natural and Synthetic
Indigo Extract
Indigo Paste
For Cotton

SALES OFFICE:
322 Ninth St., Brooklyn, N.Y.
WORKS:
Hamilton Ave. and Gowanus Canal
Brooklyn, N. Y.

National Aniline & Chemical Co., Inc.

244 Madison Avenue New York

THE LARGEST

MANUFACTURERS

OF

ANILINE COLORS

AND

COAL TAR PRODUCTS

IN AMERICA

BRANCH OFFICES:

BOSTON
PHILADELPHIA
CHICAGO
CINCINNATI
BUFFALO
HARTFORD
PROVIDENCE
CHARLOTTE
MILWAUKEE
MINNEAPOLIS
KANSAS CITY

FACTORIES:

BROOKLYN
BUFFALO
WAPPINGERS FALLS
MARCUS HOOK